

Brief Stormceptor Sizing Report - CB 12

Project Information & Location			
Project Name	Estates at Bull Meadow	Project Number	066
City	North Grafton	State/ Province	Massachusetts
Country	United States of America	Date	11/14/2016
Designer Information		EOR Information (optional)	
Name	Brian Marchetti	Name	
Company	McCarty Engineering, Inc.	Company	
Phone #	978-534-1318	Phone #	
Email	bmarchetti@mccartydb.com	Email	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	CB 12
Target TSS Removal (%)	80
TSS Removal (%) Provided	96
Recommended Stormceptor Model	STC 450i

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	% TSS Removal Provided
STC 450i	96
STC 900	98
STC 1200	98
STC 1800	98
STC 2400	99
STC 3600	99
STC 4800	99
STC 6000	99
STC 7200	99
STC 11000	100
STC 13000	100
STC 16000	100
StormceptorMAX	Custom

RECEIVED

NOV 22 2016

PLANNING BOARD
GRAFTON, MA

Sizing Details			
Drainage Area		Water Quality Objective	
Total Area (acres)	0.1	TSS Removal (%)	80.0
Imperviousness %	50.6	Runoff Volume Capture (%)	
Rainfall		Oil Spill Capture Volume (Gal)	
Station Name	WORCESTER WSO AP	Peak Conveyed Flow Rate (CFS)	
State/Province	Massachusetts	Water Quality Flow Rate (CFS)	0.03
Station ID #	9923	Up Stream Storage	
Years of Records	58	Storage (ac-ft)	Discharge (cfs)
Latitude	42°16'2"N	0.000	0.000
Longitude	71°52'34"W	Up Stream Flow Diversion	
		Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD) The selected PSD defines TSS removal		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Notes
<ul style="list-style-type: none"> Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
<http://www.imbriumsystems.com/technical-specifications>

Brief Stormceptor Sizing Report - CB 13

Project Information & Location			
Project Name	Estates at Bull Meadow	Project Number	066
City	North Grafton	State/ Province	Massachusetts
Country	United States of America	Date	11/14/2016
Designer Information		EOR Information (optional)	
Name	Brian Marchetti	Name	
Company	McCarty Engineering, Inc.	Company	
Phone #	978-534-1318	Phone #	
Email	bmarchetti@mccartydb.com	Email	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	CB 13
Target TSS Removal (%)	80
TSS Removal (%) Provided	88
Recommended Stormceptor Model	STC 450i

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	% TSS Removal Provided
STC 450i	88
STC 900	92
STC 1200	92
STC 1800	93
STC 2400	94
STC 3600	95
STC 4800	96
STC 6000	97
STC 7200	97
STC 11000	98
STC 13000	98
STC 16000	99
StormceptorMAX	Custom

Sizing Details			
Drainage Area		Water Quality Objective	
Total Area (acres)	0.2	TSS Removal (%)	80.0
Imperviousness %	63.3	Runoff Volume Capture (%)	
Rainfall		Oil Spill Capture Volume (Gal)	
Station Name	WORCESTER WSO AP	Peak Conveyed Flow Rate (CFS)	
State/Province	Massachusetts	Water Quality Flow Rate (CFS)	0.07
Station ID #	9923	Up Stream Storage	
Years of Records	58	Storage (ac-ft)	Discharge (cfs)
Latitude	42°16'2"N	0.000	0.000
Longitude	71°52'34"W	Up Stream Flow Diversion	
		Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD) The selected PSD defines TSS removal		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Notes
<ul style="list-style-type: none"> Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
<http://www.imbriumsystems.com/technical-specifications>

Brief Stormceptor Sizing Report - CB 14

Project Information & Location			
Project Name	Estates at Bull Meadow	Project Number	066
City	North Grafton	State/ Province	Massachusetts
Country	United States of America	Date	11/14/2016
Designer Information		EOR Information (optional)	
Name	Brian Marchetti	Name	
Company	McCarty Engineering, Inc.	Company	
Phone #	978-534-1318	Phone #	
Email	bmarchetti@mccartydb.com	Email	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	CB 14
Target TSS Removal (%)	80
TSS Removal (%) Provided	93
Recommended Stormceptor Model	STC 450i

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	% TSS Removal Provided
STC 450i	93
STC 900	96
STC 1200	96
STC 1800	97
STC 2400	98
STC 3600	98
STC 4800	98
STC 6000	98
STC 7200	99
STC 11000	99
STC 13000	99
STC 16000	99
StormceptorMAX	Custom

Sizing Details			
Drainage Area		Water Quality Objective	
Total Area (acres)	0.2	TSS Removal (%)	80.0
Imperviousness %	55.4	Runoff Volume Capture (%)	
Rainfall		Oil Spill Capture Volume (Gal)	
Station Name	WORCESTER WSO AP	Peak Conveyed Flow Rate (CFS)	
State/Province	Massachusetts	Water Quality Flow Rate (CFS)	0.07
Station ID #	9923	Up Stream Storage	
Years of Records	58	Storage (ac-ft)	Discharge (cfs)
Latitude	42°16'2"N	0.000	0.000
Longitude	71°52'34"W	Up Stream Flow Diversion	
		Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD) The selected PSD defines TSS removal		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Notes
<ul style="list-style-type: none"> Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
<http://www.imbriumsystems.com/technical-specifications>

Brief Stormceptor Sizing Report - DMH 2

Project Information & Location			
Project Name	Estates at Bull Meadow	Project Number	066
City	North Grafton	State/ Province	Massachusetts
Country	United States of America	Date	11/14/2016
Designer Information		EOR Information (optional)	
Name	Brian Marchetti	Name	
Company	McCarty Engineering, Inc.	Company	
Phone #	978-534-1318	Phone #	
Email	bmarchetti@mccartydb.com	Email	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	DMH 2
Target TSS Removal (%)	80
TSS Removal (%) Provided	83
Recommended Stormceptor Model	STC 450i

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	% TSS Removal Provided
STC 450i	83
STC 900	89
STC 1200	89
STC 1800	89
STC 2400	92
STC 3600	92
STC 4800	94
STC 6000	94
STC 7200	95
STC 11000	97
STC 13000	97
STC 16000	97
StormceptorMAX	Custom

Sizing Details			
Drainage Area		Water Quality Objective	
Total Area (acres)	1.01	TSS Removal (%)	80.0
Imperviousness %	56.2	Runoff Volume Capture (%)	
Rainfall		Oil Spill Capture Volume (Gal)	
Station Name	WORCESTER WSO AP	Peak Conveyed Flow Rate (CFS)	
State/Province	Massachusetts	Water Quality Flow Rate (CFS)	0.34
Station ID #	9923	Up Stream Storage	
Years of Records	58	Storage (ac-ft)	Discharge (cfs)
Latitude	42°16'2"N	0.000	0.000
Longitude	71°52'34"W	Up Stream Flow Diversion	
		Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD) The selected PSD defines TSS removal		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Notes
<ul style="list-style-type: none"> Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
<http://www.imbriumsystems.com/technical-specifications>

Brief Stormceptor Sizing Report - DMH 7A

Project Information & Location			
Project Name	Estates at Bull Meadow	Project Number	066
City	North Grafton	State/ Province	Massachusetts
Country	United States of America	Date	11/14/2016
Designer Information		EOR Information (optional)	
Name	Brian Marchetti	Name	
Company	McCarty Engineering, Inc.	Company	
Phone #	978-534-1318	Phone #	
Email	bmarchetti@mccartydb.com	Email	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	DMH 7A
Target TSS Removal (%)	80
TSS Removal (%) Provided	85
Recommended Stormceptor Model	STC 450i

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	% TSS Removal Provided
STC 450i	85
STC 900	91
STC 1200	91
STC 1800	91
STC 2400	93
STC 3600	94
STC 4800	95
STC 6000	95
STC 7200	96
STC 11000	97
STC 13000	98
STC 16000	98
StormceptorMAX	Custom

Sizing Details			
Drainage Area		Water Quality Objective	
Total Area (acres)	2.1	TSS Removal (%)	80.0
Imperviousness %	18.5	Runoff Volume Capture (%)	
Rainfall		Oil Spill Capture Volume (Gal)	
Station Name	WORCESTER WSO AP	Peak Conveyed Flow Rate (CFS)	
State/Province	Massachusetts	Water Quality Flow Rate (CFS)	0.24
Station ID #	9923	Up Stream Storage	
Years of Records	58	Storage (ac-ft)	Discharge (cfs)
Latitude	42°16'2"N	0.000	0.000
Longitude	71°52'34"W	Up Stream Flow Diversion	
		Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD) The selected PSD defines TSS removal		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Notes
<ul style="list-style-type: none"> Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
<http://www.imbriumsystems.com/technical-specifications>

Brief Stormceptor Sizing Report - DMH 8

Project Information & Location			
Project Name	Estates at Bull Meadow	Project Number	066
City	North Grafton	State/ Province	Massachusetts
Country	United States of America	Date	11/14/2016
Designer Information		EOR Information (optional)	
Name	Brian Marchetti	Name	
Company	McCarty Engineering, Inc.	Company	
Phone #	978-534-1318	Phone #	
Email	bmarchetti@mccartydb.com	Email	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	DMH 8
Target TSS Removal (%)	80
TSS Removal (%) Provided	82
Recommended Stormceptor Model	STC 450i

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	% TSS Removal Provided
STC 450i	82
STC 900	88
STC 1200	88
STC 1800	88
STC 2400	91
STC 3600	91
STC 4800	93
STC 6000	94
STC 7200	95
STC 11000	96
STC 13000	96
STC 16000	97
StormceptorMAX	Custom

Sizing Details			
Drainage Area		Water Quality Objective	
Total Area (acres)	1.5	TSS Removal (%)	80.0
Imperviousness %	42.2	Runoff Volume Capture (%)	
Rainfall		Oil Spill Capture Volume (Gal)	
Station Name	WORCESTER WSO AP	Peak Conveyed Flow Rate (CFS)	
State/Province	Massachusetts	Water Quality Flow Rate (CFS)	0.38
Station ID #	9923	Up Stream Storage	
Years of Records	58	Storage (ac-ft)	Discharge (cfs)
Latitude	42°16'2"N	0.000	0.000
Longitude	71°52'34"W	Up Stream Flow Diversion	
		Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD) The selected PSD defines TSS removal		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Notes
<ul style="list-style-type: none"> Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
<http://www.imbriumsystems.com/technical-specifications>